Five-Year Review Report

Second Five-Year Review Report

for

Velsicol Chemical Corporation Site

St. Louis
Gratiot County, Michigan

September 2002

PREPARED BY:

United States Environmental Protection Agency
Region 5
Chicago, Illinois

Approved by:

Wm. E. Muno

William E. Muno, Director
Superfund Division
U.S. EPA

Date:

9/25/02

Five-Year Review Report

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List of Acronyms

ARAR	Applicable or relevant and appropriate requirement
ATSDR	Agency for Toxic Substances and Disease Registry
CJ	Consent Judgement
CERCLA	Comprehensive Environmental Response Compensation Liability Act
DDT	1,1,1-Trichloro-2,2-bis(p-chlorophenyl) Ethane
DNAPL	Dense non-aqueous phase liquid
FS	Feasibility Study
HBB	Hexabromobenzene
MDEQ	Michigan Department of Environmental Quality
MDHP	Michigan Department of Public Health
NCP	National Contingency Plan
NPL	National Priorities List
OU	Operable Unit
PBB	Polybrominated biphenyls
PRP	Potentially Responsible Party
PPM	Parts per million
RI	Remedial Investigation
RCRA	Resource Correction and Recovery Act
ROD	Record of Decision
RPM	Remedial Project Manager
TOC	Total organic carbon
TRIS	Tris(2,3-Dibromopropyl) Phosphate
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile Organic Chemical

Executive Summary

The remedy for the Velsicol Chemical Site in St. Louis, Michigan included excavation and disposal of contaminated soils in an on-site disposal area; isolation of the Site from surrounding groundwater with a 2 foot thick, low-permeability slurry wall around the perimeter of the Site; covering the Site with a 3 foot thick, low-permeability, clay cap; implementation of other measures including monitoring well installation, ground water elevation monitoring, control of ground water levels within the Site boundaries, and provisions for long-term operation and maintenance of the Site. This remedy was implemented by Velsicol as a requirement of a December 27, 1982, judicial Consent Judgment (CJ) between U.S. EPA, the State of Michigan, and Velsicol. Velsicol completed construction in November 1984, and was required to maintain ground water levels within the containment system to achieve compliance with the Consent Decree. The previous five-year review was completed on August 27, 1997.

The assessment of this five-year review found that the remedy at OU 1 is not protective. Remedial Investigation (RI) activities currently being performed by the Michigan Department of Environmental Quality (MDEQ) provide data indicating the cap and slurry wall components of the Site containment system are not functioning as intended and are no longer protective of human health and the environment.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name (*from WasteLAN*): Velsicol Chemical Corporation

EPA ID *(from WasteLAN*): MID000722439

Region: 5	**State: MI**	**City/County: St. Louis, Gratiot**

SITE STATUS

NPL status: X Final ☐ Deleted ☐ Other (specify) _____

Remediation status (choose all that apply): ☐ Under Construction ☐ Operating X Complete

Multiple OUs?* X YES ☐ NO	**Construction completion date:** 12 /01 /1984

Has site been put into reuse? ☐ YES X NO

REVIEW STATUS

Lead agency: X EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author name: Stephanie Ball

Author title: Remedial Project Manager	**Author affiliation**: U.S. EPA

Review period:** 10 / 31 / 2001 to 09 / 30 /2002

Date(s) of site inspection: Monthly visits throughout the year

Type of review:

☐ Post-SARA X Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion

Review number: ☐ 1 (first) X 2 (second) ☐ 3 (third) ☐ Other (specify) _____

Triggering action:
☐ Actual RA Onsite Construction at OU #2 ☐ Actual RA Start at OU#_____
☐ Construction Completion X Previous Five-Year Review Report
☐ Other (specify)_____

Triggering action date (*from WasteLAN*): 08 / 27 /1997

Due date (*five years after triggering action date*): 08 / 27 / 2002

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

- The cap was not constructed with an adequate frost protection layer and is not graded properly.
- During the MDEQ Phase I Investigation significant defects, including NAPL permeations and discontinuities were identified in the slurry wall in the vicinity of the NAPL seep area.
- Several NAPL and groundwater seeps and areas of ground water upwelling to the Pine River at Site were identified. These occurrences suggest the Site containment system is not preventing off-site migration of contaminants to the Pine River.
- The NAPL seeps contain very high concentrations of pesticides, VOCs, SVOCs and metals. Contaminant concentrations were reported at levels more than 85,000 times greater than MDEQ groundwater Surface Water Interface (GSI) criteria.
- Evidence of significant levels of contamination was found in samples collected from Site soil, sediment and groundwater.
- The cap and slurry wall components of the Site containment system are not functioning as intended and are no longer protective of human health and the environment.

Recommendations and Follow-up Actions:

MDEQ is currently conducting an OU 1 Remedial Investigation (RI) consisting of two phases. Phase 1 field activities have been completed. The primary objectives of the Phase 1 activities were to : locate the slurry wall; characterize soil and groundwater chemistry immediately inside and outside of the slurry wall area; complete an initial evaluation of the slurry wall and cap performance; and, provided recommendations for the Phase 2 investigation. Phase 2 field activities are currently on-going. Phase 2 objectives consist of the following:

- Define the nature and extent of the NAPL source area immediately upgradient of the NAPL seep area.
- Evaluate effectiveness of the slurry wall by conducting dye studies, soil borings, continued monitoring of hydraulic head of the containment system, and NAPL compatability testing.
- Evaluate the effectiveness of the underlying till
- Evaluate the interaction between the shallow and lower aquifers and the Pine River by installing additional shallow and deep monitoring wells

Protectiveness Statement(s):

The assessment of this five-year review found that the cap and slurry wall components of the Site containment system are not functioning as intended and are no longer protective of human health and the environment.

Other Comments:

None

Five-Year Review Report

I. Introduction

The purpose of five-year reviews is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and recommendations to address them.

The Agency is preparing this five-year review pursuant to CERCLA §121 and the National Contingency Plan (NCP). CERCLA §121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews*.

The Agency interpreted this requirement further in the National Contingency Plan (NCP); 40 CFR §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The United States Environmental Protection Agency (EPA) Region 5 has conducted a five-year review of the remedial actions implemented at the Velsicol Chemical site in St. Louis, Michigan. This review was conducted from October 2001 through August 2002. This report documents the results of the review. The MDEQ is currently conducting Remedial Investigation activities for OU1.

This is the second five-year review for the Velsicol Chemical site. The triggering action for this review is the date of the first five-year review as shown in EPA's WasteLAN database: August 27, 1997. This review is being conducted as a matter of Policy because the remedy selected for OU1 is pre-SARA and hazardous substances, pollutants, or contaminants are left on site above levels that allow for unlimited use and unrestricted exposure. Response actions for OU2 are on-going.

II. Site Chronology

Table 1: Chronology of Site Events

Event	Date
Initial discovery of problem or contamination	**October, 1978**
Pre-NPL responses	**1978 - 1980**
NPL listing	**September 8, 1983**
Enforcement documents (Consent Judgement)	**December 27, 1982**
Remedial design start	**December 27, 1982**
Remedial design complete	**January 27, 1983**
Actual remedial action start	**January 27, 1983**
Construction dates (start, finish)	**January, 1983 - November, 1984**
Construction completion date	**December 1, 1984**
U.S. EPA Removal Assessment	**February 1990 - June 1990**
U.S. EPA Removal Assessment	**May 1992 - September 1992**
Final Close-out Report	**September 25, 1992**
Previous five-year reviews	**August 27, 1997**
U.S. EPA OU2 Removal Actions start	**September 30, 1998**
U.S. EPA OU2 Removal Actions complete	**October 30, 1999**
U.S. EPA OU2 Removal Actions start	**February 1997 - December 2005**
U.S. EPA OU2 Removal Actions (planned) complete	**December 2005 (planned)**
Community Involvement Start	**December 31, 1996**
MDEQ OU1 Remedial Investigation Start	**October 2001**

III. Background

Physical Characteristics

The Velsicol Chemical Superfund site is located at 500 Bankston Street, Gratiot County, St. Louis, Michigan. There are two operable units (OU) at the Velsicol Site. OU1, consists of the 52 acre main plant site, which was the location of the former chemical manufacturing facility. OU2 consists of contamination in the sediments and fish in the lower and middle basins of the St. Louis Impoundment of the Pine River. See Figure 1.

Land and Resource Use

The Velsicol Site was once a chemical processing plant and refinery. The current land use of the surrounding area is residential, agricultural, and recreational. The site itself is currently fenced enclosing all soils on-site.

History of Contamination

The Velsicol Chemical Site (“Site”) is an approximately 52 acre parcel that was once occupied by a chemical processing plant and contaminated sediments in the St. Louis Impoundment of the Pine River. The chemical plant operated from 1936 through 1978 and manufactured a variety of organic and inorganic chemicals including polybrominated biphenyls (PBB), hexabromobenzene (HBB), 1,1,1-Trichloro-2,2-bis(p-chlorophenyl) Ethane (DDT), and Tris(2,3-Dibromopropyl) Phosphate (TRIS). The Site represented a threat to public health, welfare, and the environment because of widespread contamination caused by poor waste management practices and direct discharge to the Pine River. In 1982, U.S. EPA and the State of Michigan entered a Consent Judgment with Velsicol for the Site. In the Consent Judgment Velsicol agreed to contain in place the 52 acre main plant site where the former chemical plant was located. The parties to the Consent Judgment concluded at that time the most appropriate alternative for the Pine River sediments was to leave the sediments in place, and the Consent Judgment released Velsicol from liability for clean up of the sediments that were contaminated at the time of entry of the Consent Judgment or became contaminated from migration or discharge from the main plant site prior to completion of the Containment System.

Upon completion of the Site characterization in the early 1980's, the State of Michigan, U.S. EPA, and Velsicol negotiated an agreement that included a remedy directed at stopping the migration of PBB, HBB, DDT and other contaminants found at the Site into the environment. The remedy selected consisted mainly of a 2 foot thick, low-permeability slurry wall around the 52 acre facility and a 3 foot thick, low-permeability, clay cap. Under the Consent Judgment Velsicol must maintain ground water levels within the slurry wall and cap (“Containment System”). Construction of the Containment

System was completed by Velsicol in 1984. The Site was proposed for inclusion on the National Priorities List (NPL) on December 30, 1982, and appeared on the final NPL on September 8, 1983.

The 52 acre main plant site is now covered with shallow-rooted grass, and, to restrict access, enclosed by a chain link fence. Velsicol is currently operating and maintaining the Site in accordance with an approved operation and maintenance plan requiring weekly inspections for signs of deterioration, quarterly monitoring of gas vents, measurement of groundwater levels within the contained Site, and slurry wall permeability testing.

Initial Response

The Consent Judgment did not require Velsicol to remove the contaminated sediments from the Pine River/St. Louis Impoundment. A 1988 Preliminary Health Assessment prepared by the Michigan Department of Public Health (MDPH) and the Agency for Toxic Substances and Disease Registry (ATSDR) concluded the river poses a potential public health concern because of possible human exposure to contaminants via ingestion of fish and direct contact with river sediments. The concern with potential fish consumption was reiterated in 1993 in an MDPH/ATSDR Site Review and Update. Contamination of fish in the river was addressed by health advisories issued by the State of Michigan. A no consumption advisory for all species of fish was initially published in the Michigan fishing guides in 1977, and is presently in effect. The no consumption advisory affects 33 river miles of the Pine River.

Water levels inside the Containment System (slurry wall and cap) remained below the level set by the 1982 Consent Judgment until February 1993. In 1993, Velsicol had to pump 1.25 million gallons of water from the Containment System to stay below the established level. In late 1994, Velsicol removed another 1.28 million gallons of ground water from the system to maintain the level set in the Consent Judgment. Velsicol has continued to pump water from the Containment System approximately every 6 months to maintain the required water level, and Velsicol has been disposing of this water off-Site. Meanwhile the State collected fish samples in late 1994 and noted that the average concentration of total DDT in skin-off filet carp samples more than doubled since the last collection in 1989. Average concentration of total DDT in 1989 was 10.5 ppm, to 1994 tissue concentrations were 23.3 ppm. The State collected fish again in 1995 and found an average total DDT concentration in skin-off filet carp samples of 16.1 ppm. The contaminant concentrations in fish tissue coupled with the water intake to the Containment System caused concern that the Containment System may have failed increasing the loading of DDT into the Pine River.

<u>OU1</u>

Velsicol agreed to reassess the Containment System to ensure that it was not a source of DDT into the Pine River. At the same time U.S. EPA and MDEQ (the Agencies)

reassessed sediment contamination in the Pine River and decided to reconsider the no action decision made in 1982.

In 1996, Velsicol completed a comprehensive assessment of the Containment System. Velsicol's assessment of the clay cap included collection of samples from the upper portion of the cap and analysis for permeability, grain size, and Atterberg limits. Assessment of the containment wall consisted of installation of inclinometers inside and outside the slurry wall at seven locations, installation of settlement plates at seven locations inside the slurry wall, collection of samples at nine locations for permeability analysis; installation of upper zone piezometers on the inside and outside of the wall at five locations; water level measurements and free product screening from all monitoring wells and piezometers; and a dye tracer study at the five locations where the piezometers were installed. Velsicol published a report entitled *Final Containment System Assessment Report, Former Michigan Chemical Plant Site, St. Louis, Michigan, October 1, 1997* detailing the Containment System assessment and results.

The Agencies agreed with the PRP's Containment System Assessment document which stated that the clay cap was leaking, probably because there is no frost protection layer on top of the cap. No obvious problems were documented with the slurry wall. Velsicol concluded in their report of the findings that the Containment System is working as designed. On December 11, 1997, Velsicol submitted a work plan entitled *Work Plan Post-Closure Cap Maintenance, Former Michigan Chemical Plant Site, St. Louis, Michigan* in which Velsicol proposed to conduct maintenance of the clay cap during the summer of 1998 by recompacting areas of the clay cap. Velsicol decided to delay this work until U.S. EPA and MDEQ completed the sediment removal project. Both EPA and MDEQ agreed.

OU2

Simultaneously with the Containment System Assessment, the Agencies began a reassessment of contamination in the Pine River/St. Louis Impoundment. During the summer of 1996 sediment cores were collected from 23 locations in the St. Louis Impoundment and analyzed for PBB, HBB and DDT. Surficial sediment samples were also collected from depositional areas in the lower Pine River (below the St. Louis dam). During the summer of 1997, the Agencies collected another round of sediment cores from 28 locations and analyzed them for DDT and total organic carbon (TOC). MDEQ collected fish for analysis.

In June 1998, the U.S. EPA signed an Action Memorandum for a time-critical removal action to initiate removal of DDT-contaminated sediment from the Pine River (OU2). The removal action consisted of excavating contaminated sediments containing approximately 3,000 mg/kg total DDT or greater. This is now referred to as the “hot spot”. In February 1999, the U.S. EPA and MDEQ signed a Record of Decision (ROD) for OU2. The selected remedy included hydraulic modification of the Pine River, excavation of sediments, de-watering and water treatment, and disposal of

contaminated sediments in either a RCRA Subtitle D or C landfill. Since 1999, clean-up of the contaminated sediments in the river has been on-going under the remedial action. Since Remedial Action work began in the river U.S. EPA has discovered seeps and sand channels below the clay river bottom contaminated with NAPLs containing high levels of DDT and other contaminates. In 2002, U.S. EPA collected 3000 gallons of NAPL from the “hot spot” cell consisting of 28 % DDT. To date, U.S. EPA has spent over $30,000,000 on the sediment cleanup and projects the total cost for the cleanup to be $60,000,000.

Basis for Taking Action

Contaminants

Hazardous substances that have been released at the site in each media include:

Soil	Sediment
DDT	DDT
PBB	PBB
HBB	HBB
Chlorobenzene	Chlorobenzene

Groundwater

DDT
PBB
HBB
Chlorobenzene

During the 1998 removal action, U.S. EPA discovered seeps from the containment system that contained high levels of DDT. MDEQ and U.S. EPA were concerned about the integrity of the containment system, and, in 2001, MDEQ drafted a work plan for a Remedial Investigation of the containment system. During the Summer of 2001, while working in a removal “hot spot” cell, U.S. EPA discovered several sand lenses containing dense non-aqueous phase liquids (DNAPLs) that had very high concentrations of DDT. Currently, MDEQ is performing the Remedial Investigation (RI) to assess the containment system and anticipates completing the RI this year. After completion of the RI, MDEQ will perform a Feasibility Study (FS). The FS will evaluate possible Remediation Alternatives using the data gathered during the RI in order to select a remedy for OU1 containment system.

IV. Remedial Actions

Remedy Selection

OU1

There is no Record of Decision for OU1. The remedy was set forth in the 1982 CJ. The 1982 CJ states that the purpose of the CJ is to protect against alleged endangerment to the public health and the environment from chemical contamination resulting from operations at Velsicol's St. Louis facilities. The 1982 CJ also states that the most appropriate environmental alternative for the Pine River/St. Louis Reservoir sediments is to leave the existing contaminated sediments undisturbed.

OU2

The selected remedy in the 1999 ROD included hydraulic modification of the Pine River, excavation of sediments, de-watering and water treatment, and disposal of contaminated sediments in either a RCRA Subtitle D or C landfill.

Remedy Implementation

The remedy set forth in the 1982 CJ included excavation and disposal of contaminated soils in an on-site disposal area; isolation of the Site from surrounding groundwater with a 2 foot thick, low-permeability slurry wall around the perimeter of the Site; covering the Site with a 3 foot thick, low-permeability, clay cap; implementation of other measures including monitoring well installation, ground water elevation monitoring, control of ground water levels within the Site boundaries, and provisions for long-term operation and maintenance of the Site.

Implementation of the remedy began in January, 1983, and was completed, on schedule, in November, 1984. The Site is now covered with shallow-rooted grass and a chain link fence.

The Consent Judgement did not require Velsicol to remove the contaminated sediments from the Pine River Reservoir. Contamination of the fish in the river was addressed by health advisories issued by the State of Michigan. A no consumption advisory for all species of fish has been in effect since 1974.

OU2

Activities were initiated at the site with Removal Action in 1998- 1999. Remedial Response activities began in 1999, which included hydraulic modifications of the Pine River, de-watering and water treatment, stabilization and excavation of sediments, and disposal of contaminated sediments in either a RCRA Subtitle D or C landfill. Remedial

Action (RA) activities have been divided into two Phases. The Phase I RA will be completed during the 2002 construction season. The Phase II RA activities are contingent upon the agencies ability to control sources from OU1.

System Operations/ O&M

Under the terms of the consent decree, Velsicol constructed a containment system consisting of a slurry wall and clay cap which was completed in 1984. Velsicol has been operating and maintaining the site since that time.

In December 1999, Fruit of the Loom ("FTL"), the parent of NWI, filed for bankruptcy under Chapter 11. U.S. EPA and MDEQ participated in negotiations with FTL, NWI, and Velsicol as part of the bankruptcy proceedings and have entered a settlement agreement which will provide FTL/NWI and Velsicol covenants not to sue for the St. Louis Facility, in return for $1.2 million in interim funding and up to $7 million for long-term funding held in a Trust Account. The bankruptcy settlement creates a successor to FTL and NWI whose purpose, among other things, is to implement the Settlement Agreement by receiving and distributing the assets to provide funding to the Custodial Trust for the Trust Accounts.

V. Progress Since the Last Review

The 1997 five year review for OU1 stated that the containment system remedy was still under evaluation by the Agencies. In addition, the Agencies were reevaluating the 1982 decision to leave contaminated sediments from the Pine River (OU2) in place. Since the previous five year review, U.S. EPA discovered seeps from the containment system that contained high levels of DDT. MDEQ and U.S. EPA were concerned about the integrity of the containment system, and, in 2001, MDEQ drafted a work plan for a Remedial Investigation of the containment system. During the Summer of 2001, while working in a removal "hot spot" cell, U.S. EPA discovered several sand lenses containing dense non-aqueous phase liquids (DNAPLs) that had very high concentrations of DDT. It is believed that these DDT NAPLs are the cause of the continuing DDT contamination in the river. Therefore OU1 is a continuing source of contamination for the Pine River. Currently, MDEQ is performing the Remedial Investigation (RI) for assessing the containment system and anticipates completing the RI this year. After completion of the RI, MDEQ will perform a Feasibility Study (FS). The FS will evaluate possible Remediation Alternatives using the data gathered during the RI in order to select a remedy for OU1 containment system.

VI. Five-Year Review Process

Administrative Components

The PRPs were notified of the initiation of the five-year review in October, 2001. The Velsicol Chemical Five-Year Review was led by Stephanie Ball of the U.S. EPA, Remedial Project Manager for the Velsicol Chemical Site and Scott Cornelius, MDEQ Project Manager.

The review consisted of the following components:

- Community Involvement
- Document Review
- Historical Data Review
- Data Collection
- Site Inspection; and,
- Five-Year Review Report Development and Review

Community Involvement

Community Involvement for the Site started in December, 1996. The Community Advisory Group (CAG) and Technical Advisory Group (TAG) have been very involved with Site activities since that time. Both U.S. EPA and MDEQ Project Managers attend monthly CAG and TAG meetings. At the meetings community members are updated on Site activities and Site concerns/questions are answered by the Project Managers. Both the CAG and TAG were notified of the five year review process. Upon completion of the Five Year Review, the community will be notified and the conclusions of the review will be presented at the October 2002, monthly CAG meeting. The Five Year Review Report will also be included in the repository which is located at the St. Louis Library, St. Louis, Michigan.

Document Review

This five-year review consisted of a review of all relevant documents including O&M records and monitoring reports.

Data Review

Historical data, seep and NAPL samples collected during U.S. EPA's on-going OU2 Remedial Actions, and data from MDEQ's Remedial Investigation have been reviewed by U.S. EPA, CH2MHill (U.S. EPA contractor), MDEQ, and Weston (MDEQ contractor).

remedy is selected and implemented for OU1, because of the following:

- The cap was not constructed with an adequate frost protection layer and is not graded properly.
- During MDEQ's Phase I Investigation significant defects, including NAPL permeations and discontinuities were identified in the slurry wall in the vicinity of the NAPL seep area.
- Several NAPL and groundwater seeps and areas of ground water upwelling to the Pine River at Site were identified. These occurrences suggest the Site containment system is not preventing off-site migration of contaminants to the Pine River.
- The NAPL seeps contain very high concentrations of pesticides, VOCs, SVOCs and metals. Contaminant concentrations were reported at levels more than 85,000 times greater than MDEQ groundwater Surface Water Interface (GSI) criteria.
- Evidence of significant levels of contamination was found in samples collected from Site soil, sediment and groundwater.
- The cap and slurry wall components of the Site containment system are not functioning as intended and are no longer protective of human health and the environment.

The following actions need to be taken in order to achieve protectiveness of human health and the environment:

- Define the nature and extent of the NAPL source area immediately upgradient of the NAPL seep area.
- Evaluate effectiveness of the slurry wall by conducting dye studies, soil borings, continued monitoring of hydraulic head of the containment system, and NAPL compatibility testing.
- Evaluate the effectiveness of the underlying till
- Evaluate the interaction between the shallow and lower aquifers and the Pine River by installing additional shallow and deep monitoring wells

XI. Next Review

The next five-year review for the Velsicol Chemical Site is required by September 2007, five years from the date of this review.

Attachments

Photos Documenting Site Conditions

FIGURES

Figure 1: Aerial Photo of Velsicol Site

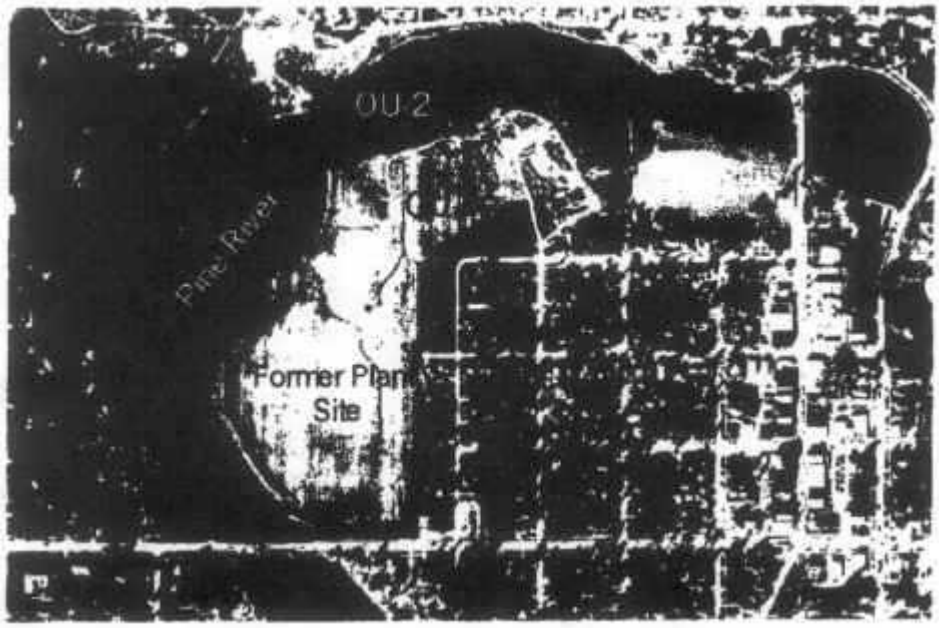

Figure 2: Close-up view of seepage from riverbank in Hot Spot Cell (June 2000)

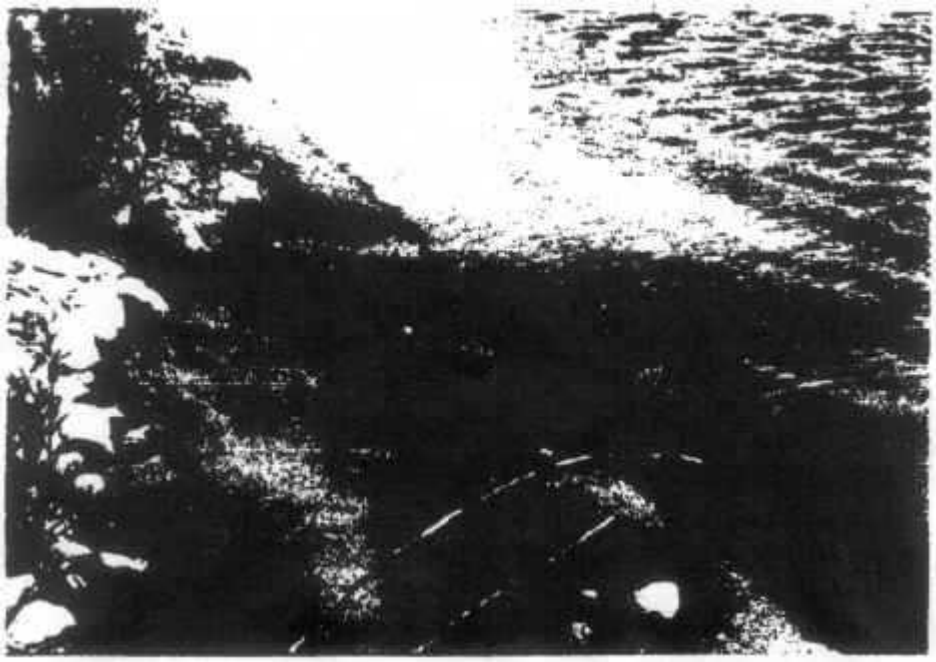

Figure 3: View of channel from the top of the riverbank

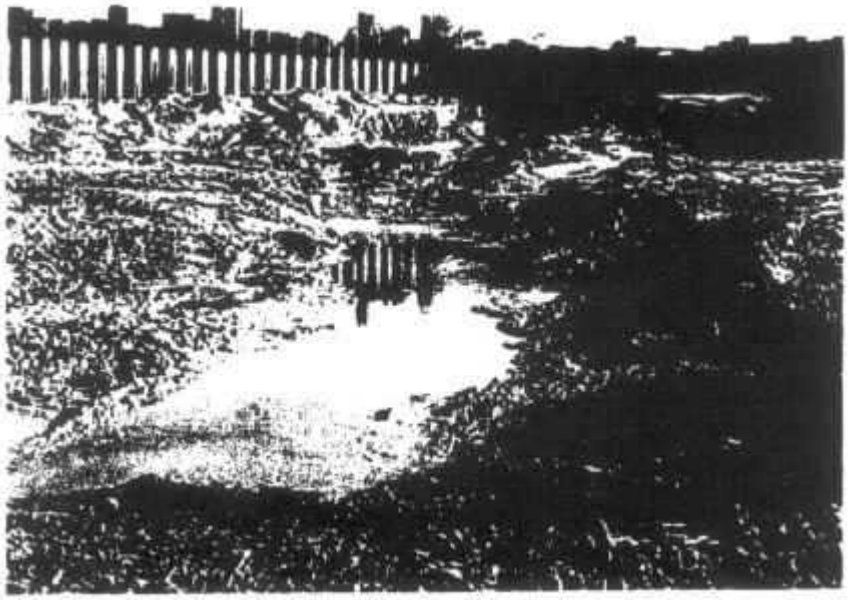

Figure 4: Channel as viewed looking from the temporary roadway towards the riverbank

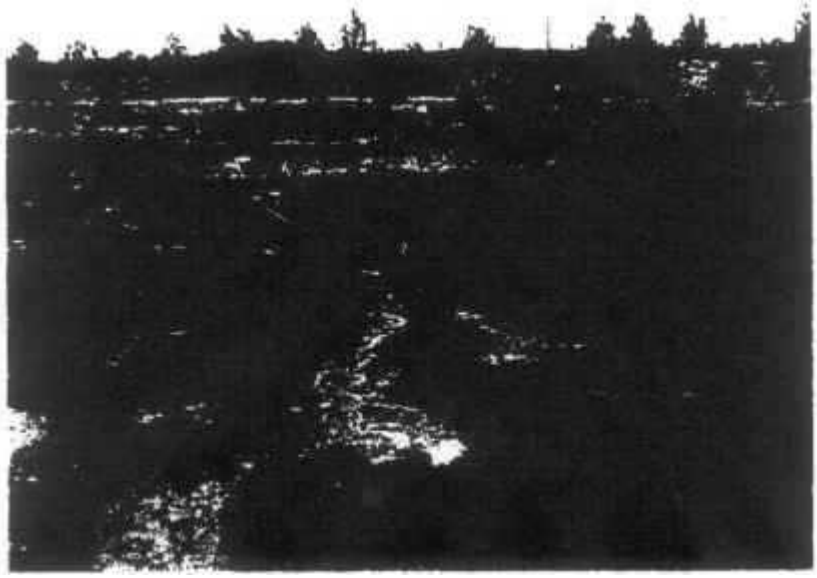

Figure 5: Close-up view of liquid running out of riverbank in the natural channel

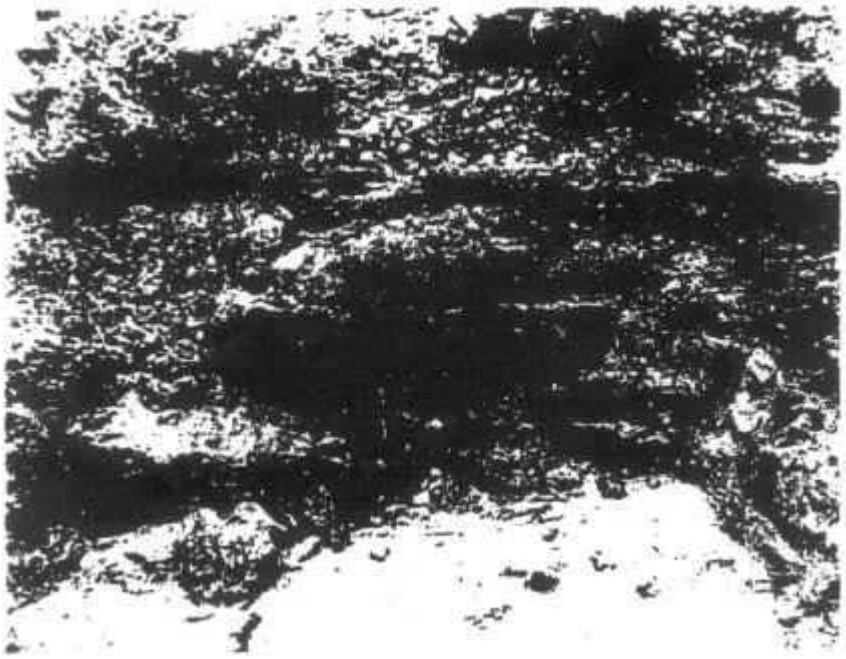

Figure 6: Black, viscous liquid present in the water in the natural channel.

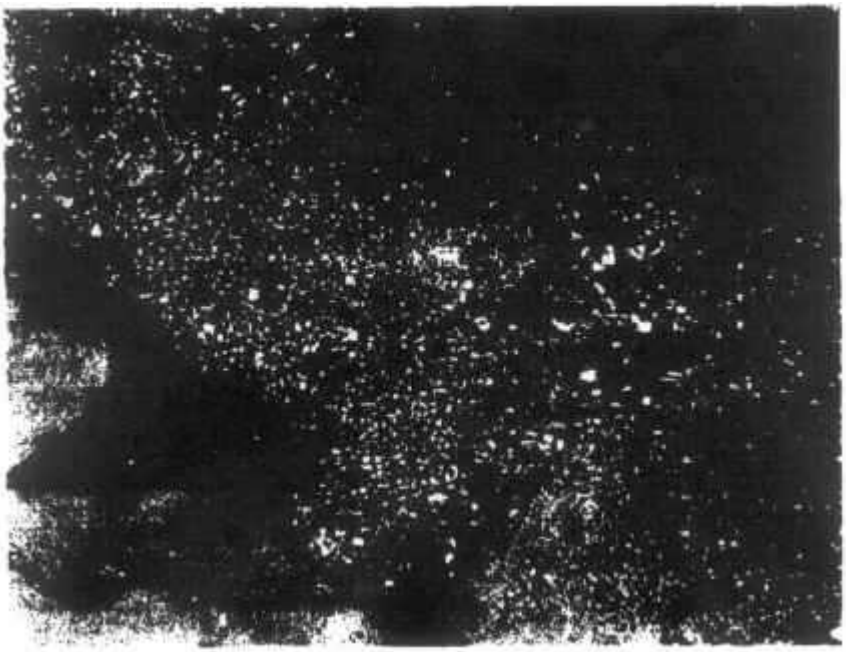

Figure 7: Another view of the black liquid in the water in the natural channel

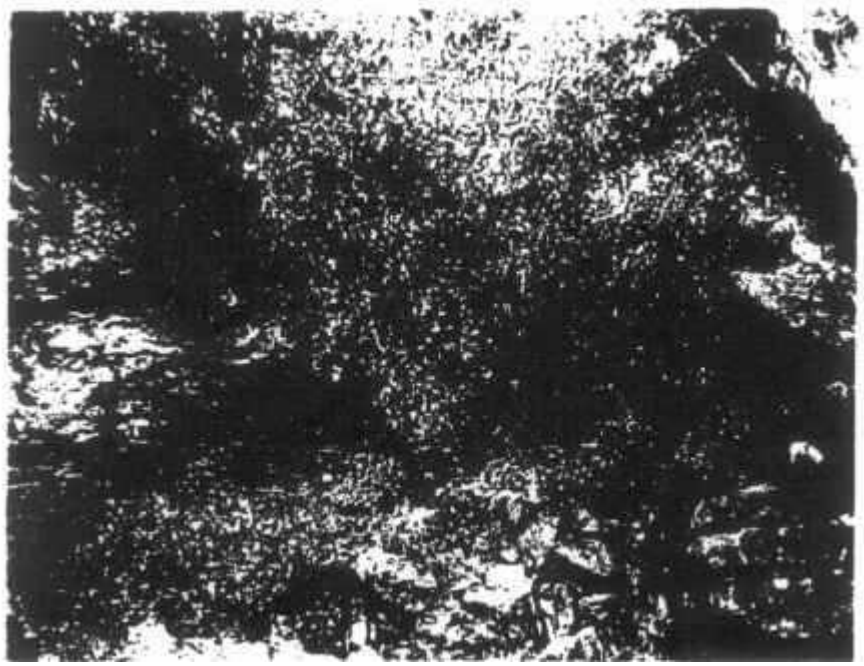

Figure 8: Close-up view of dark puddle in previous photograph